RENEWABLES 2018
GLOBAL STATUS REPORT

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REN21

Renewables in Heating, Cooling, & Transport
Clean Energy Solutions Center Webinar
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REN21 is a global multi stakeholder network dedicated to the rapid uptake of renewable energy worldwide.

**Industry Associations:**
- ARE, ACORE, ALER, APREN, CREIA, CEC, EREF, GOGLA, GSC, GWEC, IREF, IGA, IHA, RES4MED, WBA, WWEA

**Science & Academia:**
- Fundacion Bariloche, IIASA, ISES, NREL, SANEDI, TERI

**International Organisations:**
- ADB, APERC, ECREEE, EC, GEF, IEA, IEC, IRENA, RCREEE, UNDP, UN Environment, UNIDO, World Bank

**NGOs:**
- CAN, CEEW, FER, GACC, GFSE, Greenpeace International, ICLEI, ISEP, MFC, SLoCaT, REI, WCRE, WFC, WRI, WWF

**National Governments:**
- Afghanistan, Brazil, Denmark, Germany, India, Norway, South Africa, Spain, UAE, USA
Collaborative annual reporting since 2005 building on international expert community. The report features:

01. Global Overview
02. Policy Landscape
03. Market & Industry Trends
04. Distributed Renewables for Energy Access
05. Investment Flows
06. Energy Systems Integration and Enabling Technologies
07. Energy Efficiency
08. Feature: Corporate Sourcing of Renewables
Another Extraordinary Year for Renewable Energy

→ Total global capacity: up almost 9% compared to 2016, 2,195 GW at year’s end (1,081 GW not incl. hydro)

→ Share in newly installed renewable power capacity:
  • Solar PV: 55%
  • Wind: 29%
  • Hydropower: 11%
  • Bio-power: 4.6%

### RENEWABLE ENERGY INDICATORS 2017

<table>
<thead>
<tr>
<th>INVESTMENT</th>
<th>2016</th>
<th>2017</th>
</tr>
</thead>
<tbody>
<tr>
<td>New investment (annual) in renewable power and fuels¹</td>
<td>billion USD</td>
<td>274</td>
</tr>
</tbody>
</table>

| POWER |
|-------|------|------|
| Renewable power capacity (including hydro) | GW | 2,017 | 2,195 |
| Renewable power capacity (not including hydro) | GW | 922 | 1,081 |
| Hydropower capacity ² | GW | 1,095 | 1,114 |
| Bio-power capacity | GW | 114 | 122 |
| Bio-power generation (annual) | TWh | 501 | 555 |
| Geothermal power capacity | GW | 12.1 | 12.8 |
| Solar PV capacity ² | GW | 303 | 402 |
| Concentrating solar thermal power (CSP) capacity | GW | 4.8 | 4.9 |
| Wind power capacity | GW | 487 | 539 |
| Ocean energy capacity | GW | 0.5 | 0.5 |

| HEAT |
|------|------|------|
| Solar hot water capacity ⁴ | GWₚ | 456 | 472 |

| TRANSPORT |
|-----------|------|------|
| Ethanol production (annual) | billion litres | 103 | 106 |
| FAME biodiesel production (annual) | billion litres | 31 | 31 |
| HVO production (annual) | billion litres | 5.9 | 6.5 |
Global new investment in renewable power and fuels in 2017: USD 279.8 billion (+2%) (USD 319.8 billion incl. large hydropower)

Developing and emerging countries invested more than developed countries for the third year running
Overall, **renewable energy** accounted for about **68%** of the total amount committed to **new power-generating capacity** in 2017.

Investment in new **renewable power** capacity was roughly **three times new fossil fuel** capacity and more than **twice** the investment in fossil fuel and nuclear combined.

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**Global Investment in New Power Capacity**

- **Nuclear power**: 9.2%
  - 42 billion USD
- **Fossil fuels**: 22.6%
  - 103 billion USD
- **Renewables (excluding hydropower >50 MW)**: 58.2%
  - 265 billion USD
- **Hydropower >50 MW**: 10%

Source: BNEF

**RENEWABLES 2018 GLOBAL STATUS REPORT**
As of 2016, renewable energy provided 18.2% (est.) of global final energy consumption.

- 10.4% modern renewables (+0.2% compared to 2015)
- 7.8% traditional biomass (-2.4% than 2015)
In 2017, renewables accounted for: 70% of net additions to global power generation capacity.

Providing 26.5% of global electricity demand.

Progress in the power sector shows that the transition to renewable energy is possible!
Global Renewable Power Capacity, 2007-2017

- World Total: 2,195 Gigawatts
- Global renewable power capacity

- Ocean, CSP and geothermal power
- Bio-power
- Solar PV
- Wind power
- Hydropower

RENEWABLES 2018 GLOBAL STATUS REPORT
High Shares of Variable Renewable Power on the Grid

Share of Electricity Generation from Variable Renewable Energy, Top 10 Countries, 2017

Share of total generation (%)

- Solar PV
- Wind power

Countries: Denmark, Uruguay, Germany, Ireland, Portugal, Spain, United Kingdom, Greece, Honduras, Nicaragua
Modern RE share in heating and cooling: **10.3%**

Deployment of renewable technologies in H&C still constrained by: **low fossil fuel prices** and **lack of policy support**

Majority of **renewable heat** supplied by: **traditional biomass**, with smaller contributions from **modern renewables**, incl. **solar thermal** and **geothermal** energy
0.7 GW of new geothermal power generating capacity online in 2017

Global total: 12.8 GW

Indonesia and Turkey continued in the lead for new installations (three-quarters of the new capacity)
100 MW of capacity came online in 2017; global capacity: 4.9 GW

Several projects that were due to enter operation during the year were delayed until 2018 and later

Global capacity increased by just over 2%

Pipeline of about 2 GW of projects under construction (particularly in China and in the Middle East and North Africa region)
35 GWth capacity of glazed (flat plate and vacuum tube technology) and unglazed collectors newly commissioned in 2017

Total global capacity: 472 GWth by year-end

Gross additions for the year down 3% from 36.2 GWth in 2016
Transport – Biofuels

- Share of renewable energy in transport: **3.1%** mainly provided by biofuels (90%)

- In 2017, **global biofuels production** increased nearly **2.5%**, to **143 billion litres**

- Biofuels production and use are very **concentrated geographically**, > **80%** production takes place in the **United States, Brazil and the EU**
Transport – EVs

→ Electrification trend:
  • Rail and light rail
  • EVs on the road passed the 3 million mark in 2017 (+70%, but only 1% of light vehicle market)

→ Potential to create a new market for renewable energy and facilitate the integration of higher shares of VRE
The “Sectoral Disconnect”

**We Consume the Most Energy for Heating, Cooling, and Transport**

Modern Renewable Energy in Final Energy Use by Sector, 2015

- **Heating and Cooling:** 48%
- **Transport:** 32%
- **Electricity:** 20%

- 39% of total annual energy-related CO₂ emissions come from heat consumption
- 10% modern renewable energy
- Additional 16% from traditional biomass
- 3% renewable energy
- 25% renewable energy

[Image: REN21 RENEWABLES 2018 GLOBAL STATUS REPORT]
The “Sectoral Disconnect”

Renewable Energy in Total Final Energy Consumption, by Sector, 2015

- **Heat**: 48%
  - 27% Renewable energy
  - 16.4% Traditional biomass
  - 1.9% Renewable electricity for heat

- **Transport**: 32%
  - 8.4% Modern renewables other than electricity
  - 2.8% Biofuels

- **Power**: 20%
  - 3% Renewable energy
  - 0.3% Renewable electricity
Renewable Energy Targets

National Sector-Specific Targets for Share of Renewable Energy by a Specific Year, by Sector, in Place at End-2017

**HEATING AND COOLING**
Targets for share of heating and cooling from renewable sources in %

Most national targets focus on the power sector, where the level of ambition is typically higher than for heating and cooling.

48 countries have national targets for renewable energy in heating and cooling.

**TRANSPORT**
Targets for share of transport energy from renewable sources in %

42 countries have national targets for renewable energy in transport.

**POWER**
Targets for share of electricity generation from renewable sources in %

146 countries have national targets for renewable energy in power.

Source: REN21 Policy Database
Renewable Energy Policy Landscape


- **Power**: 128 countries
- **Transport**: 70 countries
- **Heating & Cooling**: 24 countries
- 29 countries had other heating and cooling policies

Source: REN21 Policy Database
Carbon pricing policies were in place in 64 jurisdictions worldwide in 2017.
Sector Coupling: Targets for RE and EVs

- Limited examples of policies that encourage/mandate the use of renewable energy in EVs (Austria and Germany)

- Countries with targets for both EVs and renewable energy in power may encourage the use of renewable deployment in transport

- Governments also are supporting EVs through public procurement
As of end-2017, corporations had actively sourced 465 TWh of renewable electricity across 75 countries.

The IT sector purchased the largest amounts of renewable energy through wind power and solar PV PPAs.

130 corporations joined the RE100 initiative.
Investment in Renewable Energy

Global New Investment in Renewable Power and Fuels, by Country or Region, 2007-2017

Source: BNEF
Renewable Energy “Champions”

### TOP 5 COUNTRIES 2017

**Annual Investment / Net Capacity Additions / Production in 2017**

<table>
<thead>
<tr>
<th>Rank</th>
<th>Country 1</th>
<th>Country 2</th>
<th>Country 3</th>
<th>Country 4</th>
<th>Country 5</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>China</td>
<td>United States</td>
<td>Japan</td>
<td>India</td>
<td>Germany</td>
</tr>
<tr>
<td>2</td>
<td>Marshall Islands</td>
<td>Rwanda</td>
<td>Solomon Islands</td>
<td>Guinea-Bissau</td>
<td>Serbia</td>
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<tr>
<td>3</td>
<td>Turkey</td>
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<td>Chile</td>
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<td>Japan</td>
<td>Turkey</td>
</tr>
<tr>
<td>6</td>
<td>South Africa</td>
<td>-</td>
<td>-</td>
<td>-</td>
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</tr>
</tbody>
</table>

- **Investment in renewable power and fuels (not including hydro over 50 MW)**
- **Investment in renewable power and fuels per unit GDP**
- **Geothermal power capacity**
- **Hydropower capacity**
- **Solar PV capacity**
- **Concentrating solar thermal power (CSP) capacity**
- **Wind power capacity**
- **Solar water heating capacity**
- **Biodiesel production**
- **Ethanol production**

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*RENEWABLES 2018 GLOBAL STATUS REPORT*
In 2016:

- **14%** of the global population lived **without electricity** – approx. 1.06 billion people
- **38%** of the global population lived **without access to clean cooking facilities** – 2.8 billion people
- **DREA systems** were serving **360 million people** by end-2016
Overall share of renewable energy has increased only modestly, due to:

- ↑ energy demand
- ↓ slow traditional biomass
- ↑ fossil and nuclear fuel

Energy-related CO₂ emissions rose for the 1st time in 4 years
Conclusions

- Global renewable power transition advancing with record capacity additions and rapidly falling costs – **The transition is possible!**
- However, progress not fast enough to reach Paris Agreement goals and SDGs
- Better-integrated sectors - planning, policies and regulatory frameworks
- Systems approach: link **energy efficiency** and **renewable energy**
- Create a **level playing field** for renewables and decentralised off-grid renewables
- **Make all trends visible**: Much is happening, but data is not consolidated – renewables at local and sub-national level, distributed off-grid renewables, innovative business models
SAVE THE DATE:
23-26 October 2019
Seoul, Republic of Korea

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